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known types is that it is made of Monel metal and is not lined. The sulphuric and nitric acids formed during the combustion of the coal sample attack the bomb very slightly. Gravimetric sulphur determinations give the sulphur correction directly. Since some of the acids are neutralized by the metal of the bomb, the nitric acid correction can not be determined, but is ordinarily too small to affect the accuracy of determinations for industrial purposes. The result is a bomb which gives results agreeing with the standard types much closer than the ordinary errors in sampling and which can be made for a small fraction of the cost of any lined calorimeter.

Non-metallic inclusions in steel: E. G. MAHIN. In this paper the origin and nature of inclusions is briefly discussed and the general effects upon the properties of the steel are noted. The principal effects are of two classes: (1) They produce the same kind of weakness as would result from cavities of similar size and form. (2) Ferrite segregation usually occurs in such a manner as that inclusions are found as nuclei of ferrite grains. If the steel is forged or rolled these grains and their inclusions become elongated and ordinary thermal treatment fails to destroy the resulting banded structure. The various theories that have been advanced to account for these facts are discussed, particular attention being devoted to the idea of Stead, to the effect that iron phosphide is entirely responsible for ferrite segregation and that inclusions have a purely incidental connection with this phenomenon. Experimental work is described, illustrated by lantern slides, as a result of which the conclusion is reached that the persistence of ferrite bands is, in fact, largely or entirely due to phosphorus, but that inclusions exert an effect upon the crystallization of ferrite which is independent of the presence of phosphorus. Certain hypotheses are advanced to account for the observed facts.

Mineral rubber: GUSTAV EGLOFF.

Manufacture of castor oil: J. H. SHRADER. A description of the technology of castor oil manufacture as practised by the castor oil manufacturers, together with that of the government plant at Gainesville.

Possibility of commercial utilization of oil from cherry pits, tomato seed and grape seed: J. H. SHRADER. The possibility of the commercial utilization of the canning house by-products of cherry pits, tomato seed and grape pomace is considered in the light of the economic question involved in

assembling the raw material before manufacturing the finished product, together with a brief description of the technical questions involved.

Sugar saving by home-grown sugar beets: JOHN M. ORT and JAMES P. WITHROW. This work was undertaken as a war help, though interest in the subject in rural communities and state institutions has existed for years. In the ordinary manufacture of beet sugar, the sugar is separated from the syrup by crystallization and the sugar then refined. This leaves most of the salts and strongly flavored organic impurities in the residual impoverished syrup of molasses so that it is fit only for cattle food or fertilizer. It is this material also which has rendered difficult the elimination of the beet flavor from the syrup from sugar beets. Otherwise the making of this syrup for home consumption would long ago have been an important rural home industry. Home cultivated sugar beets properly trimmed, peeled, decorated and sliced were found to yield a bright syrup with good taste upon treatment with hot water after a preliminary wash and then boiling down. This gives a sweetening available for many culinary purposes and in which, with ordinary care, the characteristic beet flavor is nearly eliminated or not too prominent for use as syrup. Contrary to the published statements no simple treatment has been found which will consistently render this syrup entirely palatable but it can be used in all cases with as little real basis for objection as the sorghum syrup so much made in rural districts. It is hoped that more resourceful investigators will succeed in the entire elimination of this disagreeable flavor, and in every case. We have but dipped into the subject.

CHARLES L. PARSONS,
Secretary

(To be continued)

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